

**Landsat Data Continuity Mission Workshop
Data Users Panel Breakout Session**

January 10, 2001

Participants

Dr. Bruce Quirk, U.S. Geological Survey (Moderator)
Dr. Richard Beck, OHIOVIEW
Dr. Brad Doorn, U S. Department of Agriculture (Panel 1)
Dr. Joanne Gabrynowicz, University of North Dakota (Panel 1)
Dr. Thomas Lillesand, University of Wisconsin (Panel 2)
Ms. Mary Pat Santoro, Army Topographic Engineering Center (Panel 2)
Mr. Gordon Wells, Texas Natural Resources Information Center (Panel 2)
Dr. Aviva Brecher, U.S. Department of Transportation
Mr. Bruce Davis, National Aeronautics and Space Administration
Mr. Jerry Garegnani, Environmental Systems Research Institute, Inc.

Discussion

Dr. Quirk opened the session by asking panelists to summarize their assessments of the workshop exchanges and to comment on the individual questions listed on the agenda. He asked participants to begin with the last question (16), which asked whether population of the USGS-held archive should be the primary objective of the LDCM. Mr. Wells and Dr. Lillesand replied that the statement was barely adequate, whereas Dr. Doorn said that for USDA purposes, it was inadequate. Mr. Garegnani suggested that secondary use also needed to be considered.

The discussion shifted to consideration of costs. Dr. Brecher stated that the cost of raw data was only one part of the picture. There needed to be a market study to explore this issue. Dr. Lillesand observed that, as the statement currently read, one literal interpretation could be that all nonseasonal data could be sold at a higher price. Agreeing, Dr. Gabrynowicz suggested that it was therefore important for this panel to make a recommendation to maintain data availability the way it was for Landsat 7. Dr. Quirk noted that USGS wanted to keep the cost of data down and even to lower it, but that there were limits to price reductions because of the need to support system operations.

There was a brief exchange about the limits on licensing. Dr. Doorn said that vendors could not license raw data. His office in USDA bought data—in fact, was required to buy data—from a vendor, but they were enhanced.

Returning to the question about primary mission, Dr. Gabrynowicz asserted that the input of the data users during the workshop was the most relevant to this issue because the

statutory context defined users as the primary drivers of data policy. She then returned to her earlier suggestion that the panel go on record to ask that data policy for the LDCM be the same as for Landsat 7. Dr. Brecher suggested that the follow-on mission could improve the previous one, perhaps through two-tier pricing. Dr. Gabrynowicz, however, thought that a new two-tier approach would not work because of policing requirements and expense. In addition, because Federal and State agencies could already receive special Government discounts, the same benefit was achieved without departing from the Landsat 7 model. At Ms. Santoro's request, Dr. Quirk provided some background on the development of requirements (e.g., 25-scene minimum) for discount purchases. He said that older data were not discounted as such because it cost the same amount to furnish these as to supply current sets. The expense of reproduction set the price baseline.

Discussion ensued about the importance of keeping the data requirements seasonal and global. Dr. Doorn and Dr. Gabrynowicz argued strongly for the global requirements, not only for their international benefits, but for U.S. purposes as well. Dr. Bruce described the Long-Term Acquisition Plan (LTAP) for scene acquisitions around the world. He said that four passes over viewing sites were required, but in practice more were made. Ground stations had data from this system that were not in the USGS archive. The system was adjusted periodically. Dr. Gabrynowicz and Dr. Doorn suggested that the LTAP system continue in the LDCM unchanged from the Landsat 7 era. Dr. Lillesand expressed some concerns about the philosophy and acquisition strategies for satellite coverage of the United States. Dr. Gabrynowicz maintained that the appropriate filter was already in place. Dr. Doorn said that the Government should retain that philosophy and extend it into the international sphere. Dr. Gabrynowicz suggested that the user community reserve an opportunity for policy input at the point of partner contract. Dr. Quirk summed up the discussion by describing Landsat as the baseline for data pricing and policy.

Turning to the data specification, Dr. Quirk homed in on the thermal band issue. Responding to Mr. Wells, Dr. Quirk said that the thermal band did not appear to present the same technical obstacles that it once did. Dr. Brecher cited the value of NASA research on heat sinks and thermal islands in populated areas. By including a thermal band and additional infrared and CO₂ bands, the LDCM could significantly improve user capabilities. USGS had, in fact, tried to push the technology. Mr. Garegnani commented that the thermal band did not seem to have been used as much as it could have and that a NASA New Millennium mission could explore the science potential of the band further. Perhaps the band should be set aside for now, however, if it continued to be a big cost driver.

The next subject addressed was desired data enhancements. Dr. Doorn suggested an 8-day viewing cycle; perhaps a series of satellites could accomplish this level of coverage. Dr. Brecher asked whether some type of cost-sharing arrangement could be developed so that additional sensors could be placed aboard a Landsat platform. Describing this as a good idea, Dr. Quirk noted that the possibility of combining several instruments on a single satellite was already under consideration. Mr. Wells mentioned an example of this

involving Aerojet. Such an approach could allow for more utilization of the thermal band.

Dr. Quirk asked for strategies to stimulate the commercial sector for products. Mr. Wells responded that this goal would not be achieved by simply relying on the value-added sector to supply the needed products. His agency could do its own data interpretation of level 0R data, assuming that Federal policy did not change. All States should have the ability to do this. Dr. Doorn noted that this could be done through a special module for processing raw data; current practice, he suggested, should be changed.

Dr. Brecher addressed various ways that user needs could be made more attractive to industry. There could be additional incentives to go high tech and to reduce costs. She suggested partnerships for designing and building a system that could be turned over to industry for operation rather than saddling NASA with the responsibility. Dr. Lillesand commented on the challenges of operating a business in the context of small policy changes that could quickly knock a company out of the market.

The discussion shifted to a consideration of data delivery times. Dr. Quirk invited participants to suggest ideal ranges. Dr. Doorn recommended 3 to 24 hours; in agriculture, applications had to be fast. Dr. Quirk asked whether this would stimulate use. It would, replied Mr. Wells, because real-time assessment would be enhanced; this would be particularly important in emergency management. Dr. Doorn referred to similar benefits for providing near-real-time data to a range of users—from the 2,500 USDA service centers around the country to foreign governments needing immediate disaster assessments. Quicker data delivery could also help pesticide users looking for favorable spraying conditions, suggested Mr. Garegnani. Dr. Lillesand likewise cited the obvious benefit to farmers facing planting decisions.

At this point, Dr. Quirk returned to the list of agenda questions for a quick run-through. After reading question 5 (cost drivers for LDCM), Dr. Quirk mentioned the proposed 8-day data cycle as an issue. There would be some additional load from this change because of the increased data gathering, processing, and distribution involved. A shorter cycle should not, however, increase the cost of reproduction.

Dr. Brecher raised the issue of oceanic coverage. Dr. Quirk responded that through LCAT, a large amount of data had been acquired on coastal areas and islands. NOAA had also done a lot of work in this area.

Turning to the commercial issue (question 7) again, Dr. Quirk asked for any further comments on an appropriate role for the commercial sector. Dr. Brecher reiterated her interest in a partnership to design, build, and operate the mission through a life-cycle contract. Dr. Doorn expressed reservations about commercializing the Landsat sensor. According to Mr. Garegnani and Dr. Brecher, this model had already been used by the telecommunications industry. Mr. Garegnani also suggested, however, that the commercialization niche for Landsat resided within the value added sector, rather than among any commercial data providers who might take on Landsat. Dr. Doorn agreed.

Returning to the data provider options again, Dr. Brecher suggested that perhaps NASA and USGS could work out an agreement with industry to include commercially attractive, high-resolution instruments in the follow-on mission.

Dr. Quirk invited further comment about what participants wanted in the LDCM. There was consensus about what they did not want—i.e., higher costs or lower quality. Mr. Gordon suggested that access to raw data would be useful. Dr. Brecher asked about onboard processing and data compression. There was a trend in industry toward doing some processing in space, Dr. Quirk said.

Continuing on to question 8, Dr. Quirk observed that it was important to maintain and expand the international ground station network as well. Panel members agreed. Mr. Garegnani asked whether configuration of the mobile Landsat data receiving station project could be enhanced so as to have more capability for receiving data in near-real time. In the view of Dr. Quirk, the limited number (three) of antennae in the system was an unfortunate limitation within the design. Mr. Garegnani suggested that the data specification could indicate a need for greater availability of mobile receiving stations. Dr. Brecher mentioned the desirability of higher data volume and transmission rates.

The review of questions continued with Dr. Quirk's reading of items 9 through 11, with no significant additions made to comments made earlier by the panelists. There was more discussion for question 12 (needed legislative changes). Dr. Bruce suggested that within the overall policy context, the U.S. program needed to be clearly defined. Dr. Doorn commented of the benefit of engaging all the various interests involved—technical specialists, policymakers, end users—to the point of asserting program ownership. The forum for dialog needed to be expanded, he said. In the view of Mr. Davis, development of a national plan or policy would not occur until the Government and industry could find a way to join forces in this effort. The European experience might shed some light on this problem.

The group considered the remaining questions without much elaboration upon what had already been said. Dr. Doorn did return to the substance of question 11 (effects of data pricing) by mentioning the benefits to valued added providers serving Federal agencies like USDA. When the price of data went down and program budgets remained constant, there were more resources available to buy value added products. The more data there were, said Mr. Garegnani, the more need for analysis and commercial products.

Dr. Quirk asked participants if they thought that any more workshops would be useful. Dr. Doorn suggested that a session on Capitol Hill might be worthwhile. Ms. Santoro indicated interest in a day or half-day meeting that could be featured in some way on the Web. Dr. Doorn indicated his interest in seeing what would be compiled from the present workshop, as well as what NASA gave as a response. Such information would help him convey to USDA a good sense of the direction of the LDCM. Dr. Quirk reminded participants that the USGS Web site would remain open for further comment.

After thanking panelists for their participation, Dr. Quirk adjourned the session.